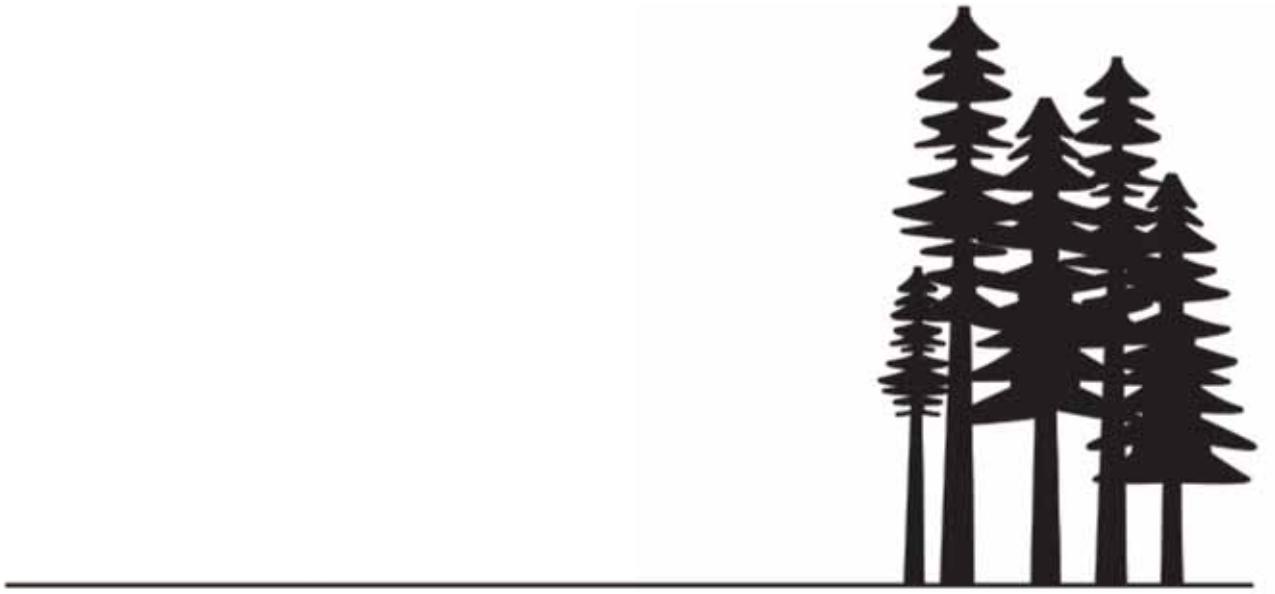

Appendix D. Timber

This appendix provides background on the analysis of timber valuation effects and the process for completing a 10 year scenario to verify the practicality of harvest scheduling the OPTIONS modeling results and to assist in estimating the effects of the alternatives.

In this appendix:

Timber Valuation

The estimate of values which would be produced by the different alternatives must take into account the volume and quality of the timber offered, and the cost of harvest and transportation. The estimate of stumpage is being completed as a portion of the analysis of effects of the alternatives the first 10 years. As the alternatives are projected forward beyond the first 10 years, changes are expected in the receipt levels as the mix of sizes, quality and species changes in response to the harvest of different stand types, growth of other stands, and the application of silvicultural practices.

Stumpage and receipts will be generally be calculated in following manner:

Stumpage = Pond value – harvest and transportation costs.

- Pond value will be a weighted pond value inclusive of both the species mix and grade of logs anticipated from the different levels and types of harvest.
- Harvest and transportation costs will be an average by harvest type for each district.

Receipts will be the sum of all stumpage prices multiplied by the corresponding log volumes.

Analytical assumptions

Prices and costs will be calculated in constant dollars, set at 2005.

Costs, species composition, recovery and grade will be developed using an historical reconstruction approach with a variety of base periods.

Costs were developed for each district by two harvest types, thinning and regeneration harvest. Sales were selected from a base period of 1996 thru 2006. The first year of the forest plan, 1995 was not used due to expected bias since watershed analysis had not yet been completed on the majority of BLM-managed lands and no road construction could be undertaken in Riparian Reserves until the completion of watershed analysis for individual watersheds.

Sales which were actually offered were included as provided by the districts, in response to a data query. Sales where data was incomplete were excluded.

Sales were included regardless of award and execution or litigation. Volume weighted averages by thinning and regeneration harvest were developed for each district to obtain a "standing tree to mill" cost including cutting, yarding, road construction, transportation, maintenance, miscellaneous and other costs used in the standard BLM appraisal methods. All costs were expressed in dollars per thousand board feet (MBF) for 16-foot short-log, Scribner scale. Costs varied considerably by district with the cost of hauling logs to the mills one of the more variable. Costs for thinnings were generally higher than for regeneration harvest.

Costs for thinning will be used in the analysis for the thinning, uneven-age harvest, and partial harvest treatments described in Alternative 3.

A base size of approximately 1,100 million board feet was included in order to estimate costs, with a total cost of over $390 million in 2005 dollars.

Species composition

Commercially valuable species compositions for the analysis were developed for each district, using an historical reconstruction technique. Volumes and percentages of volume by species were developed using the period 1990 thru 2006(in part) as the base period.

Analysis of the data contained in the species data base of TSIS (Timber Sale Information System), the BLM accounting and record keeping system for timber sales, indicates a high level of similarity of species between districts with the exception of the Klamath Falls Resource Area.

Douglas-fir is the dominant commercial species with all districts having a harvest percentage of Douglas-fir by volume at or near 80 percent. Stratifying the base period into pre-Northwest Forest Plan, (1990-1995), early Northwest Forest Plan (1996-2000), and current Northwest Forest Plan era (2001-2006) yields only minor changes in species composition of sales. This species percentage composition has remained generally constant despite a substantial change in the harvest types and ages harvested over these three periods.

No formal sampling method was used to select a sample of sales available for use. Sales with missing or incomplete information were excluded. Some sales from the base period had been archived from TSIS, and were not included, as information was not available. Emphasis was placed on including large sales, as well as those from pre-Northwest Forest Plan years. Sales of less than one million board feet and those consisting of primarily fire salvage were excluded.

Log Quality

Log quality was estimated using historical reconstruction of log grades weighted by volume. Few sales were available in older forest types across the districts for the Northwest Forest Plan era, so sales from 1985-1990 were used to develop estimates for harvest of older timber, with the exception of Coos Bay district, where no records of this time could be located. For the Coos Bay district the base period of 1970-1975 was used.

Sales were included when the data was available, complete and legible. Sales of less than one million board feet were excluded as were certain salvage sales where species bias was likely. With the exception of the Klamath Falls resource area, 150-300+ MMBF were included in the reconstruction base for each district.

District cruiser estimates were used for grade breaks in thinnings where the price differences between lower sawlog grades are low.

Four types of forest stands were used to estimate quality by percent of volume. First are thinning stands. These were typically commercial thinning or density management treatments designed to remove/prevent suppression mortality and improve stand composition, vigor or value. Cruiser estimates of sawlog grade percentages will be used for these stands, in particular the DF 4 sawlog. The second type is regeneration or clearcut treatment in young stands, typically less than 80-100 years of age depending upon site quality. A modest number of pre-Northwest Forest Plan stands are available for this estimation, and some Northwest Forest Plan regeneration harvests fall within this category. The third type is mature stands, generally older than 80-100 years, typically dominated by one species, and generally of higher overall density. These stands correspond to the mature structural stage. Fourth are stands older than 150-200 years corresponding to the structurally complex classification. A more complete description of these structural stages is contained in Appendix 12: Ecology, Section I – Structural Stage Classification.

For each district, average percentages by log grade for each of these structural classes will be prepared for Douglas-fir, ponderosa pine, white fir, and sugar pine. Other species will be estimated using a camp run method with no grade differentiation. Analysis of the data indicates that higher log grades in other than these four species are rare.

The sales used as a basis were classified by structural stage class, described above, using a combination of local knowledge, species composition, average log size in board feet, and average number of Douglas-fir trees per acre.. Typically, stands with more than 100 trees per acre and an average log volume of less than 100 board feet would be in the "young" stand classification. The "structurally complex" class would contain stands with less than 40 trees/acre of the dominant species and average log volume generally greater than 200 board feet. The "mature" stand class would lie between these figures. These levels will differ by district based on differences in site productivity. Volume weighted percentages of grades were then developed by structural classes and by district.

Preparation of weighted pond values

Species composition will be assumed to be similar between regeneration harvest and thinning.

Species were consolidated into commonly used groups for which prices are available. For example, true firs and hemlocks were consolidated into "white wood"

For Douglas-fir, sugar pine and ponderosa pine, prices will be a weighted average by grade for the stand categories of young, mature and structurally complex.

Prices for species and grades, where applicable, were averaged levels for calendar year 2005 for commonly priced groups, using data obtained from Log Lines Log Price Reporting Service (published monthly) PO Box 2215 Mount Vernon WA 98273, loglines@fidalgo.net)."

Weighted pond values for each district were then prepared for young, mature and structurally complex stand classes using the pricing groups, grade weighted prices for Douglas-fir, sugar pine, and ponderosa pine, and consolidated percentages for grouped species such as true firs and hemlocks with their associated camp run prices. Log volumes and prices published in Log Lines are based on 32 foot long-log volumes. BLM volumes are expressed in 16-foot short-log, Scribner scale. Conversion factors used to adjust prices to 16-foot short-log were 0.8 for sawlog grades and 0.85 for peeler grades

The above matrix of weighted pond values will be held in 2005 dollars for the 10 year estimate of stumpage and receipts, as will costs.

Calculation of bid ratio

The period between 1990 and 2006 was used to calculate an average bid ratio for each district. This information was extracted from the BLM's TSIS database system and was volume weighted.

Preparation of stumpage and receipt estimation

For each district, each harvest type and each stand structural stage matrix will be prepared which will subtract harvesting costs from weighted pond values. Thinning costs will be used for the partial harvest in Alternative 3 due to the anticipated difficulties associated with this type of harvest in mature and structurally complex stands.

Once a matrix of stumpage values for the various treatments and stand categories has been prepared, anticipated receipts are calculated by multiplying the stumpage value per thousand board feet by the corresponding harvest level by structural stage to obtain a total expected price for the 10 years.

No correction for the "delay" in harvest after sale will be made. After a sale is sold and executed, a delay in sale receipts will normally occur since receipts are not generated until harvest occurs. This may be immediately after execution, or may be delayed depending upon seasonal requirements, sale specifications such as required construction or market conditions. In a similar manner, no delay will be assumed for litigation of individual sales.

Ten-Year Scenario Quality Check

The ten-year scenario is a method of both verifying the practicality of the harvest scheduling as modeled, and a method of estimating the effects to soils and hydrology by developing estimates of road construction and acres harvested by harvesting method.

The ten-year scenario is a simulation, and is a single solution to harvest scheduling in the first ten years. There may be a large number of solutions to implementation in the first 10 years in terms of both harvest locations and harvest types. It is intended to be representative of the implementation of the plan for the first 10 years, but is not intended to be used to predict or decide locations of actual harvest units.

Procedure

Once harvest units are modeled by OPTIONS as harvested in the first 10 years, the locations and harvest types are mapped with accompanying tables of information. These maps are distributed to the districts for analysis. District planners and others familiar with harvest unit design and road systems develop road locations and harvest methods for the selected units. These designs are captured in a Geographic Information System mapping database and assembled for analysis.

The OPTIONS model selects units for harvest based on a WOPR ID number. These WOPR ID units are polygons in the Geographic Information System database used for analysis of alternatives. They are typically subdivisions of the Forest Operations Inventory polygons, and are formed by the intersection and overlay of a variety of Geographic Information System layers or themes such as roads, streams, etc. (See Appendix Q - Vegetative Modeling for further information).

Planners examine the **sampled** (see below) WOPR ID units as these ID units are formed into logical larger harvest units where the WOPR ID units are contiguous. Planners then use a variety of Geographic Information System themes such as elevation contours, streams, ownership boundaries, etc. to create a “paper plan” for each harvest unit.

Once harvest units are determined, planners use local knowledge and the Geographic Information System theme layers to locate and document the existing roads and new road construction needed for access, location of landings to be constructed, and the harvest method (ground based, cable/skyline or helicopter) to be used.

Once these Geographic Information System themes have been completed, the layers are assembled and are overlaid in order to perform operations to assemble the information at a variety of scales.

Sampling

Since the ten-year scenario is a simulation, these methods provide an estimate of such effects as miles of new road construction, acres of ground-based harvest, and number of new stream crossings.

In order to develop the estimates in a reasonable time and with a reasonable level of effort, a sampling method was developed to select a portion of the simulated units for analysis.

Sections where harvest occurs within the ten-year scenario are sampled at a 1 in 3 random sample. Results from this sampling are developed as ratios such as miles of new road construction per million board feet, by thinning or regeneration harvest. These ratios are then expanded to the entire population to yield estimates of the amount for the entire harvest over the 10 years.

Sampling a particular township, range, and section is not stratified. That is to say that all sections where at least one WOPR ID unit is harvested have an equal chance of being sampled independent of the size of harvest within that section and independent of the acres of BLM land within that section.

Although units are selected by section, examination of the results show that many metrics such as acres sampled or volume sampled are within a few percent of the expected values of 33 percent. Actual expansion is based upon the sampled volume level.

The ratios developed are split by district, alternative, harvest type (thinning/regeneration harvest), and road type (temporary/permanent and surfaced/natural). These ratios are then expanded to estimate the total miles of road by road and harvest type, the acres disturbed from construction, etc. Once these ratios are developed, they are prorated to other units for expansion.